

4/17/2013



RELIABILITY MONITOR REPORT  
FOR

**QSOP Package**

**MAXIM INTEGRATED**

160 RIO ROBLES  
SAN JOSE, CA 95134

This Report was prepared by  
**MAXIM INTEGRATED Reliability Engineering**

**Summary:**

The data in the tables that follow was generated as the result of an on-going Package Reliability Monitor. The specific assemblies included in this package monitor are:

ASSY SITE	PINS	PACKAGE		
ATP (Amkor, PI)	16	QSOP (Pb-Free)	ATP (Amkor, PI)	24 QSOP (Pb-Free)
ATP (Amkor, PI)	28	QSOP (Pb-Free)	ATP (Amkor, PI)	16 QSOP-EP (Pb-Free)
Carsem-M	16	QSOP (Pb-Free)	UTL Thailand	16 QSOP (Pb-Free)
UTL Thailand	24	QSOP (Pb-Free)	UTL Thailand	28 QSOP (Pb-Free)
UTL Thailand	16	QSOP-EP (Pb-Free)		

The calculated failure rate for this assembly is:

**FAILURE RATE: MTTF (YRS): 37893 FITS: 3.0**

The parameters used to calculate this failure rate are as follows:

**Cf: 60% Ea: 0.7 Tu: 25 °C**

The reliability data follows. A the start of this data is a description of the assembly vehicle used to generate this reliability data. The next section is the detailed reliability data for each stress. The reliability data section includes the latest data available. This report covers data between 4/1/2012 and 3/31/2013.

**Assembly Information:**

Package Type: QSOP (Pb-Free)  
Date Code Range: 1103 to 1250

**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	1103	MAX4967EGEE/V+	135°C	1000 HRS	90	0	
HIGH TEMP OP LIFE	1104	MAX11632EEG+	135°C	1336 HRS	79	0	
<b>Total:</b>						<b>0</b>	

**STORAGE LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	1202	MAX7325AEG+	150°C	500 HRS	45	0	
STORAGE LIFE	1209	MAX11616EEE+	150°C	500 HRS	50	0	
STORAGE LIFE	1211	MAX16980GEE/V+	150°C	500 HRS	50	0	
STORAGE LIFE	1216	MAX1231BCEG+	150°C	500 HRS	80	0	
STORAGE LIFE	1216	MAX1231BCEG+	150°C	500 HRS	80	0	
STORAGE LIFE	1216	NAX1231BCEG+	150°C	500 HRS	80	0	
STORAGE LIFE	1221	MAX9526AEI/V+	150°C	500 HRS	50	0	
STORAGE LIFE	1230	MAX16969BGEE+	150°C	500 HRS	45	0	
STORAGE LIFE	1237	MAX16975BAEE/V+	150°C	500 HRS	45	0	
STORAGE LIFE	1237	MAX16975BAEE/V+	150°C	500 HRS	45	0	
STORAGE LIFE	1247	MAX16975BAEE/V+	150°C	500 HRS	45	0	
<b>Total:</b>						<b>0</b>	

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE, 5' RAMP, 10' DWELL	1202	MAX7325AEG+	-65C TO 150C	500 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1209	MAX11616EEE+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1210	MAX16917BGEE/V+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1210	MAX16917BGEE/V+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1210	MAX16917BGEE/V+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1211	MAX11628EEE/V+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1211	MAX16980GEE/V+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1214	MAX11616EEE+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1214	MAX9526AEI/V+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1216	MAX1231BCEG+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1216	MAX1231BCEG+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1216	MAX1231BCEG+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1221	MAX9526AEI+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1224	MAX9526AEI+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1224	MAX9526AEI+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1230	MAX16969BGEE	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1236	MAX16953AEE/V+	-65C TO 150C	500 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1237	MAX16975BAEE/V+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1237	MAX16975BAEE/V+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1247	MAX16975BAEE/V+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1249	MAX16969BGEE/V+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1250	MAX16969BGEE/V+	-65C TO 150C	500 CYS	80	0	
<b>Total:</b>						<b>0</b>	

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**TEMPERATURE HUMIDITY BIAS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	1201	MAX11628EEE/V+	130C, 85% R.H.	100 HRS	80	0	

BIASED MOISTURE	1209	MAX11616EEE+	130C, 85% R.H.	100	HRS	32	0
BIASED MOISTURE	1211	MAX11628EEE/V+	130C, 85% R.H.	100	HRS	80	0
BIASED MOISTURE	1214	MAX11616EEE+	130C, 85% R.H.	100	HRS	32	0
BIASED MOISTURE	1224	MAX9526AEI+	130C, 85% R.H.	100	HRS	32	0
BIASED MOISTURE	1224	MAX9526AEI+	130C, 85% R.H.	100	HRS	32	0
BIASED MOISTURE	1237	MAX16975BAEE/V+	130C, 85% R.H.	100	HRS	48	0
<b>Total:</b>							<b>0</b>

### UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	1209	MAX11616EEE+	130C, 85% R.H.	100	HRS	80	0
MOISTURE SOAK	1214	MAX11616EEE+	130C, 85% R.H.	100	HRS	80	0
MOISTURE SOAK	1224	MAX9526AEI+	130C, 85% R.H.	100	HRS	80	0
MOISTURE SOAK	1237	MAX16975BAEE/V+	130C, 85% R.H.	100	HRS	80	0
MOISTURE SOAK	1237	MAX16975BAEE/V+	130C, 85% R.H.	100	HRS	80	0
MOISTURE SOAK	1247	MAX16975BAEE/V+	130C, 85% R.H.	100	HRS	80	0
MOISTURE SOAK	1249	MAX16969BGEE/V+	130C, 85% R.H.	100	HRS	80	0
MOISTURE SOAK	1250	MAX16969BGEE/V+	130C, 85% R.H.	100	HRS	80	0
<b>Total:</b>							<b>0</b>

### Assembly Information:

Package Type: QSOP-EP (Pb-Free)

Date Code Range: 1221 to 1252

### STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	1221	MAX16975AAEE/V+	150°C	500	HRS	50	0
STORAGE LIFE	1233	MAX16946GEE/V+	150°C	500	HRS	50	0
STORAGE LIFE	1252	MAX16975AAEE/V+	150°C	500	HRS	50	0
STORAGE LIFE	1252	MAX16975AAEE/V+	150°C	1000	HRS	50	0
<b>Total:</b>							<b>0</b>

### TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE, 5' RAMP, 10' DWELL	1221	MAX16975AAEE/V+	-65C TO 150C	500	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1232	MAX16946GEE/V+	-65C TO 150C	500	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1232	MAX16946GEE/V+	-65C TO 150C	500	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1232	MAX16946GEE/V+	-65C TO 150C	500	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1233	MAX16946GEE/V+	-65C TO 150C	500	CYS	80	0

TEMP CYCLE, 5' RAMP, 10' DWELL	1233	MAX16946GEE/V+	-65C TO 150C	500	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1233	MAX16946GEE/V+	-65C TO 150C	500	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1252	MAX16975AAEE/V+	-65C TO 150C	500	CYS	80	0
<b>Total:</b>							<b>0</b>

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**TEMPERATURE HUMIDITY BIAS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	1232	MAX16946GEE/V+	130C, 85% R.H.	100	HRS	33	0
BIASED MOISTURE	1232	MAX16946GEE/V+	130C, 85% R.H.	100	HRS	33	0
BIASED MOISTURE	1232	MAX16946GEE/V+	130C, 85% R.H.	100	HRS	35	1
BIASED MOISTURE	1233	MAX16946GEE/V+	130C, 85% R.H.	100	HRS	33	0
<b>Total:</b>							<b>1</b>

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	1221	MAX16975AAEE/V+	130C, 85% R.H.	100	HRS	80	0
MOISTURE SOAK	1232	MAX16946GEE/V+	130C, 85% R.H.	100	HRS	80	0
MOISTURE SOAK	1232	MAX16946GEE/V+	130C, 85% R.H.	100	HRS	80	0
MOISTURE SOAK	1232	MAX16946GEE/V+	130C, 85% R.H.	100	HRS	80	0
MOISTURE SOAK	1233	MAX16946GEE/V+	130C, 85% R.H.	100	HRS	79	0
MOISTURE SOAK	1233	MAX16946GEE/V+	130C, 85% R.H.	100	HRS	80	0
MOISTURE SOAK	1233	MAX16946GEE/V+	130C, 85% R.H.	100	HRS	80	0
MOISTURE SOAK	1252	MAX16975AAEE/V+	130C, 85% R.H.	100	HRS	80	0
<b>Total:</b>							<b>0</b>

**FAILURE RATE: MTTF (YRS): 37893 FITS: 3.0**